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DESCRIPTION OF A NEW POLYCHAETE, *ONUPHIS PUNGGOLENSIS* (ONUPHIDAE), FROM SINGAPORE

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ABSTRACT

A new species of onuphid worm, *Onuphis punggolensis*, from Sungei Punggol, Singapore is described. This is the first record of the genus *Onuphis* and is the third onuphid species to be documented from Singapore waters. The new species is related to *O. eremita* Audouin and Milne Edwards and its congeners. The main differences lie in the absence of interramal papillae at the base of dorsal cirri in setigers 4 to 10, pigmentation pattern of the dorsal region, the presence of subdermal spots along the length of the occipital ceratophores, and relatively fewer number of ceratophore rings.

The onuphid polychaetes from Singapore waters are poorly studied with only two species previously recognized to date (Tan and Chou, 1993; Tan and Chou, 1996). These species are *Diopatra neapolitana* (Della Chiaje, 1841) and *D. bulohensis* Tan and Chou (1996) reported from Kampong Mata Ikan shore and Sungei Buloh respectively. The former species was recorded from a survey of the literature (Vohra, 1972). Onuphid species constitute about 3% of the total number of polychaete fauna documented from Singapore (Tan and Chou, 1993).

The present paper reports the discovery of a third onuphid species belonging to the genus *Onuphis* from Singapore waters. This is also the first record of the genus from Singapore. The material on which this study is based was procured from the benthic invertebrate survey conducted at Sungei [= river] Punggol, located on the northeastern coast of Singapore (Fig. 1). The survey was conducted by the Reef Ecology Study Team, National University of Singapore using both the Smith-McIntyre grab and Naturalist rectangular dredge.

Members of the genus *Onuphis* are characterized by having occipital ceratophores distinctly longer than the length of the prostomium with usually more than 10 rings. Anterior lateral styles are shorter than their ceratophores. Anterior setigers have tridentate pseudocompound hooks and branchiae are present either as single filaments or pectinate. More than 30 species have been described in this genus and they are mostly reported from shallow waters less than 50 m in the western Pacific Ocean and the Indian Ocean (Fauchald, 1982). Comprehensive revisions of this genus were made by Fauchald (1982) and Paxton (1986).

The present species differs from *O. eremita* Audouin and Milne Edwards, 1833 and its subspecies in a number of morphological features and is described here as a new species. Specimens of this new species were catalogued and deposited at the Zoological Reference Collection (ZRC), School of Biological Sciences, National University of Singapore. A specific key to the family Onuphidae from Singapore is also given.

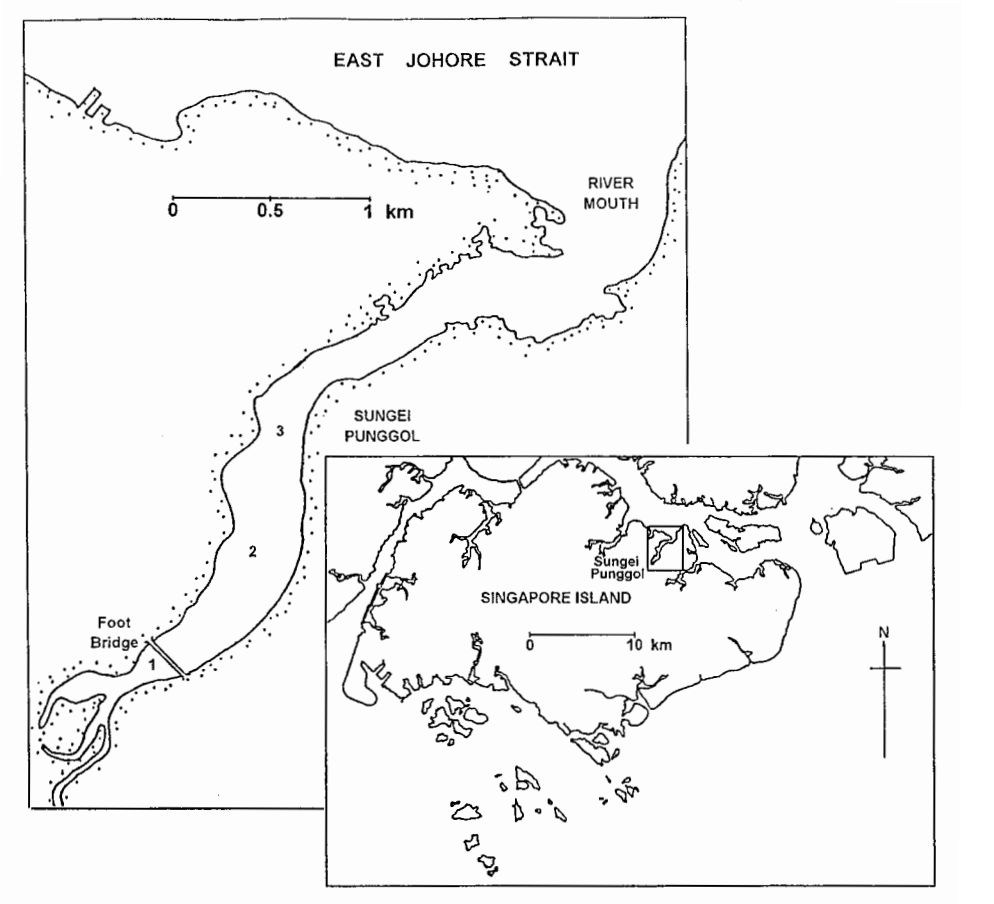

Figure 1. Map of Sungei Punggol indicating sites of collection. Insert shows location of Sungei Punggol in Singapore.

Key to Species of Onuphidae from Singapore

1a. Branchiae in part spiralled 2
1b. Branchiae pectinate ..... *Onuphis punggolensis*, new species
2a. Anterior setigers with both strong unidentate and bidentate hooded hooks ..... *Diopatra bulohensis*, Tan and Chou, 1996
2b. Anterior setigers with only bidentate hooded hooks ..... *Diopatra neapolitana*, (Delle Chiaje, 1841)

SYSTEMATICS

Family Onuphidae Kinberg 1865
Subfamily Onuphinae Kinberg 1865
Genus *Onuphis* Audouin and Milne Edwards
Onuphis punggolensis new species
(Fig. 2)

Material examined.—Holotype—ZRC1996.1565, incomplete specimen, 29.2 mm long (77 setigers), 0.7 mm wide (station 2). Paratypes (14 specimens) - ZRC1996.1566, incomplete specimen, 22.7 mm long (75 setigers), 0.9 mm wide (station 1); ZRC1996.1567, incomplete specimen, 25.5 mm long (91 setigers), 1 mm wide (station 1); ZRC1996.1568, incomplete specimen, 17.3 mm long (68 setigers), 1.1 mm wide (station 1); ZRC1996.1569, incomplete specimen, 27.8 mm long (84 setigers), 1.4 mm wide (station 1); ZRC1996.1570, incomplete specimen, 27.0 mm (84 setigers), 1.4 mm wide (station 1); ZRC1996.1571, incomplete specimen, 17.0 mm long (53 setigers), 1.1 mm wide (station 1); ZRC1996.1572, incomplete specimen, 16.8 mm long (46 setigers), 1 mm wide (station 1); ZRC1996.1573, incomplete specimen, 20.2 mm long (56 setigers), 1.2 mm wide (station 1); ZRC1996.1574, incomplete specimen left in tube, 35.5 mm long, 1.2 mm wide, (station 1); ZRC1996.1575, incomplete specimen, 17.4 mm long (76 setigers), 0.4 mm wide (station 2); ZRC1996.1576, incomplete specimen, 18.4 mm (62 setigers), 0.8 mm wide (station 2); ZRC1996.1577, incomplete specimen, 15.7 mm long (38 setigers), 0.8 mm wide (station 2); ZRC1996.1578, incomplete specimen, 23.0 mm long (68 setigers), 1.2 mm wide (station 3); ZRC1994.3580, incomplete specimen, 22.8 mm long (80 setigers), 1 mm wide (station 1).

Description.—All specimens examined are incomplete; the holotype with 77 setigers, measuring 29.2 mm in length and 1.7 mm wide, including parapodia. Specimen having the following color markings: even brown pigmentation on prostomium, brown spots appearing subdermally along the length of occipital ceratophores; two spots on the median ceratophore and three spots on each of the inner laterals and outer laterals. The number of spots on the median ceratophores for all specimens is always less than on the inner and outer laterals. The number of spots varies ranging from 2 to 5. Peristomium and anterior dorsal seven setigers with even brown bands on the anterior and posterior border (Fig. 2A,B). Additional distinct brown median pigmentation occurring on each anterior segment with brown patch near each parapodial base. Median pigmentation on the first setiger of some specimens diffused. Pigmentation of posterior setigers with thin brown band on anterior margin and small brown patch on lower basal dorsum. Distinct parapodial basal brown patches are also present.

Prostomium is subtriangular with a rounded anterior margin; it has a pair of conical, frontal palps. There is a pair of minute eyes located at the outer base of the outer lateral antennae. Of the five antennae the outer lateral antennae reach the posterior margin of setiger 1 (1–2 in paratypes); the ceratophores have 12 short basal articles and one long distal article, and are longer than the styles. The inner lateral antennae reach setiger 8 (5–8), with the ceratophores consisting of 15–16 short basal and the long distal one; the median antenna reaches setiger 7 (3–7), with ceratophores consisting of 9 short articles plus the long distal article. The peristomial cirri arise from the anterior margin of the peristomium (Fig. 2A), reaching back the middle of the first setiger.

Anterior six setigers longer than posterior ones and parapodia are directed forward. The first parapodium (Fig. 2C) with a low rounded presetal lobe and spindle-shaped

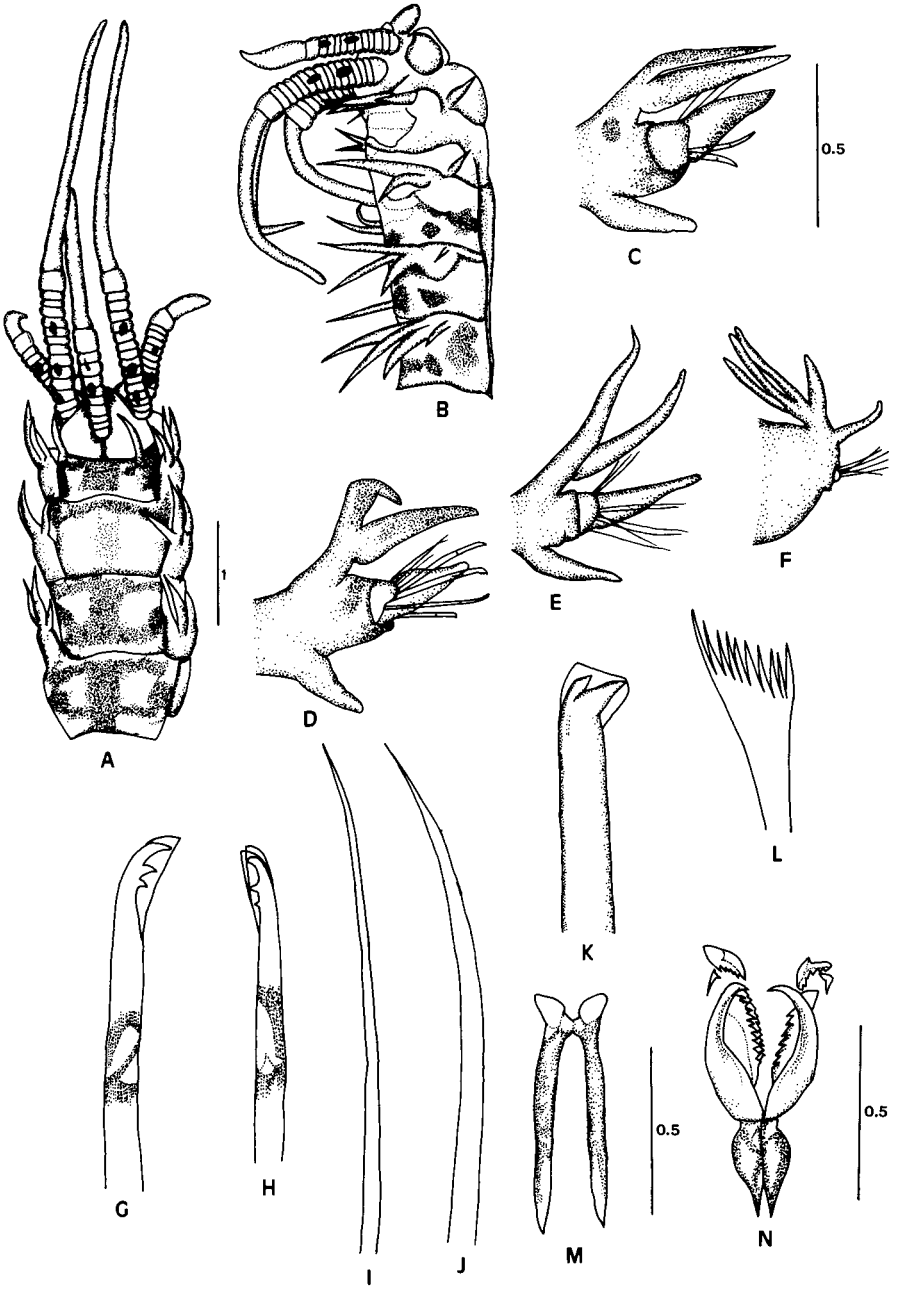

Figure 2. *Onuphis punggolensis*, new species, (ZRC1996.1565, Holotype). A. dorsal view of anterior end; B. anterior end, lateral view; C. first parapodium, anterior view; D. second parapodium, anterior view; E. fourth parapodium, anterior view; F. 16th parapodium, anterior view; G. large tridentate median pseudocompound hook from setiger 1, ×100; H. slender tridentate median pseudocompound hook from setiger 1, ×100; I. slender limbate seta from setiger 4, ×100; J. thick limbate seta from setiger 4, ×100; K. subacicular hook from setiger 10, ×100; L. pectinate seta from setiger 5, ×100; M. mandibles; N. asymmetrical maxillae. (Scale bars in mm)

postsetal lobe. Dorsal cirrus is slender, digitiform. The ventral cirrus is slightly shorter than the postsetal lobe. The second to fourth parapodia are similar in shape (Fig. 2D,E). The presetal lobe of the fifth parapodium decreased to small rounded lobe. Postsetal lobes are digitiform to setiger 14; appear as small subtriangular lobes thereafter (Fig. 2F). The ventral cirri becoming shorter and rounder on the seventh and eighth parapodia. They are replaced by glandular pads in all setigers thereafter. Absence of interramal papillae on anterior parapodia.

Single filament branchiae are present from setiger 1 to setiger 16 and they are as long as the dorsal cirri. Two filaments appear first on setiger 17; the number of filaments increase to about 4 filaments in a pectinate arrangement posteriorly.

Low hooded, tridentate, pseudocompound hooks present in the first three setigers. Bidentate pseudocompound hooks are absent. These hooks number 3 to 5; the superior hook (Fig. 2G) is thicker than the inferior hooks (Fig. 2H). Two kinds of limbate setae are present; in the first 3 setigers only slender limbate setae (3–4 long and 2–4 short limbate setae) are present (Fig. 2I); but from setiger 4 thick limbate setae are present as well. In this segment 5 thick (Fig. 2J) and 4 slender limbate setae are present. Two bidentate subacicular hooks (Fig. 2K) are present from setiger 10. Pectinate setae (Fig. 2L) present from setiger 4 and appear as distally oblique with 10 to 11 teeth.

Mandibles (Fig. 2M) with low cutting plates and slender dark shafts. Maxillary formula (Fig. 2N) is 1 + 1, 8 + 8, 9 + 0, 6 + 7, and 1 + 1. Whole jaw-apparatus appears whitish. Tube thin and encrusted with fine sand.

Etymology.—The name of the new species is derived from the name of its type locality, Sungei Punggol.

Remarks.—*Onuphis punggolensis* resembles *O. eremita* Audouin and Milne Edwards, 1833 and its subspecies; *O. eremita oculata* Hartman, 1951 and *O. eremita parva* Berkeley and Berkeley, 1941. Both *O. eremita oculata* and *O. eremita parva* differ from the main form in having eyes and in the occurrence of pseudocompound hooks in 4 setigers respectively (Fauchald, 1982). The present species, *O. punggolensis* differs from *O. eremita* and its congeners mainly by the absence of interramal papillae at the base of the dorsal cirri in setigers 4 to 10 (Fauchald, 1982; Paxton, 1986). By comparison, *O. punggolensis* resembles closer to *O. eremita oculata* described from intertidal to shelf depths off the Gulf of Mexico in the following characters: presence of eye spots, single filament branchiae starting from setiger 1, first three setiger with tridentate pseudocompound hooks, and subacicular hooks first appearing from setiger 9–10. However, *O. punggolensis* differs from *O. eremita oculata* in that (1) the ceratophore rings appear to be relatively fewer in numbers, ranging from 10 to 17 rings instead of 12 to 20 rings in *O. eremita oculata*, (2) the ceratophore rings have distinct subdermal brown spots along its length, which are absent in the latter species, and (3) the pigmentation patterns on the dorsum with brown patch on the basal end and a thick vertical brown band on each segment. Both *O. punggolensis* and *O. eremita oculata* differ from the main form, *O. eremita* Audouin and Milne Edwards, 1833 known from La Rochelle, France in having eye spots and slightly shorter occipital antennae for the latter species (Fauchald, 1982).

Distribution.—Specimens of *O. punggolensis* have a limited distribution at Sungei Punggol. Of a total of 15 specimens, ten were collected from station 1 mainly by a Smith-McIntyre grab. Only four specimens and one specimen were obtained from stations 2 and 3 respectively. The soft bottom of stations 1 to 3 is characterized by sandy mud to muddy substrate as well as lower levels of salinity, ranging from 22.0 to 25.0‰, due to mixing of freshwater draining from the inland.

Acknowledgments

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Literature Cited

Audouin, J. V. and H. M. Edwards, 1833. Classification des Annélides, et description de celles qui habitent les côtes de la France. Ann. Sci. Nat. Paris, Ser.1. 28: 187–247.

Berkeley, E. and C. Berkeley, 1941. On a collection of polychaeta from Southern California. So. Cal. Acad. Sci. Bull. 40: 16–60.

Delle Chiaje, S. 1841. Descrizione e notomia degli animali invertebrati della sicilia cateriore osservati vivi negli anni 1822–1830. 3 vols. Naples.

Fauchald, K. 1982. Revision of *Onuphis, Nothria,* and *Paradiopatra* (Polychaeta: Onuphidae) based upon type material. Smithson. Contrib. Zool. 356: 1–109.

Hartman, O. 1951. The littoral marine annelids of the Gulf of Mexico. Publ. Inst. Mar. Sci. (Port Aransas). 2: 7–124.

Paxton, H., 1986. Generic revision and relationships of the Family Onuphidae (Annelida: Polychaeta). Rec. Aust. Mus.. 38: 1–74.

Tan, L. T. and L. M. Chou. 1993. Checklist of polychaete species from Singapore waters (Annelida). Raff. Bull. Zoo. 41: 279–295.

_____ and _____. 1996. *Diopatra bulohensis*, a new species of Onuphidae (Polychaeta) from Sungei Buloh, Singapore. Raff. Bull. Zoo. 44: 357–362.

Vohra, F. C. 1972. Preliminary observations on population fluctuations and breeding on a tropical sandy shore. Malay. J. Sci., I(A): 71–92.

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